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Rivellia basilaris (WIEDEMANN) (Diptera, Platystomatidae) and its Allied Species in East Asia, II

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Abstract The following five new species of the genus *Rivellia* are described: *R. curvinervis* n. sp. from the Philippines, and *R. dasyixys* n. sp., *R. fulvidorsalis* n. sp., *R. kaochangensis* n. sp., and *R. varia* n. sp., from Thailand.

Key words: *Rivellia*; Platystomatidae; East Asia; new species.

In the previous paper of the series (HARA, 1993), I treated *Rivellia basilaris* (WIEDEMANN) and three related species. In this paper I describe five new *Rivellia* species from East Asia, which are allied to *R. basilaris*.

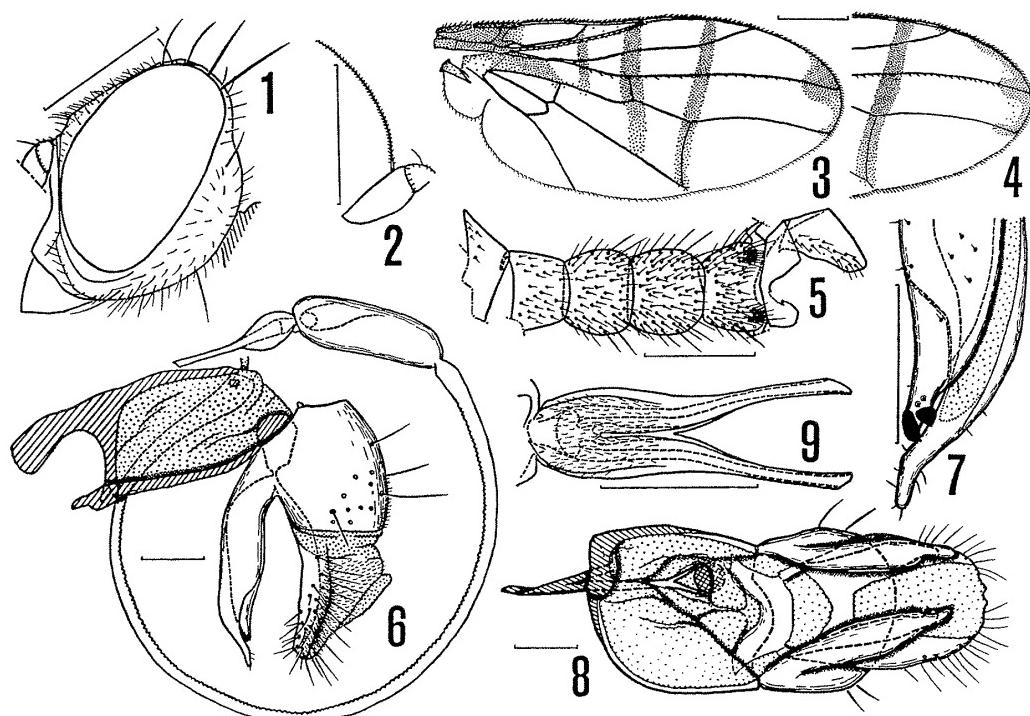
Rivellia varia n. sp.

(Figs. 1–13)

Male and female. Similar to *R. basilaris*, but differing from it as follows:

Body sometimes darker; e.g., in holotype, head and thorax dark brown, abdomen blackish brown, legs dark brown, yellow on coxa to femur of fore leg, apical thirds of mid and hind femora, and basal two-thirds of tarsi, halter brown. Wing marking dark brown; apex of cell r_1 not darkened (Fig. 3), or with small weak spot which is isolated from other markings (Fig. 4); marking on wing apex projecting basally, strongly on vein R_{4+5} and weakly on M_1 (Fig. 3), strongly on R_{4+5} and M_1 respectively (Fig. 4), or rarely weakly on R_{4+5} and strongly on M_1 ; this marking usually widely separated from apex of R_{2+3} (Fig. 3), sometimes with narrow anterior lobe extending near apex of R_{2+3} along C (Fig. 4).

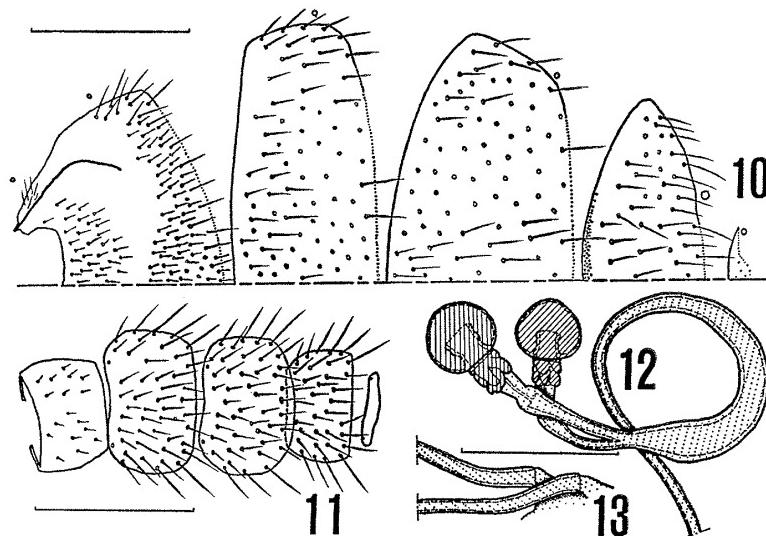
Head as in Fig. 1. Parafacial slightly narrower than diameter of facet of eye. Front-orbital bristles subequal in length. First flagellomere (Fig. 2) about twice as long as thick, with dorsal margin almost straight in lateral view. Clypeus with medial height about half as long as that of face. Scutum with pair of bristles which are located anterolaterally to posterior dorsocentral bristles. Male hind trochanter with narrow and short hairs as in female. Distance between apical scutellar bristles about 1.5 times as long as that between basal and apical scutellar bristles. Wing (Figs. 3–4): Distance between apices of R_1 and R_{2+3} about as long as or somewhat longer than that between apices of R_{2+3} and R_{4+5} . Male abdomen (Figs. 5–9): Fifth tergite and sternite combined by weakly sclerotized transverse bands at their



Figs. 1–9. *Rivellia varia* n. sp., male (holotype: Figs. 1–3, 5–6, 8–9). — 1, Head in lateral view; 2, right antenna in inner view; 3, right wing; 4, apical part of right wing; 5, first to eighth abdominal sternites; 6, terminalia in lateral view; 7, apical parts of left inner and outer surstyli in inner view; 8, terminalia in anteroventral view; 9, apical part of glans in anterior view. Scales indicate 0.5 mm in Figs. 1–5, and 0.1 mm in Figs. 6–9.

posterolateral corners; fourth sternite slightly wider or slightly longer than wide, about as long as third one; fifth sternite mostly covered with hairs; hairs on this sternite somewhat dense posterolaterally; sixth sternite broad; outer surstyli with long and narrow apical projection, without group of minute teeth on inner side; inner surstyli without membranous cleft, fused with tenth sternite and hypoproct basally; hypandrial ring almost straight in lateral view from left; acrophallus about 3/5 as long as basal sclerotized capsule of glans. Female abdomen (Figs. 10–13): Tergites mostly covered with hairs; fourth tergite longer than third and fifth ones; second to fifth sternites each wider than long; distance between fifth spiracles longer than that between sixth spiracles; spermatheca spherical, with large basal projection which is covered with scale-like tubercles; spermathecal ducts subequal in length, with thick walls throughout.

Measurements. Body length, 3.1–3.7 mm (3.3 mm in holotype). Wing length, 2.8–3.4 mm (3.0 mm in holotype). Gena/head capsule in height, 0.12–0.17 (0.16 in holotype). Distance between junctions of M with dm-cu and r-m/that between junctions of M with r-m and bm-cu, 0.65–0.80 (0.76 in holotype). Distance between apex of M_1 and junction of dm-cu with M/that between junctions of dm-cu with M and CuA₁, 2.2–2.4 (2.2 in holotype). Ratio of lengths of third to fifth tergites, 0.83–



Figs. 10–13. Female abdomen of *Rivellia varia* n. sp. — 10, First to sixth tergites and spiracles (dots on the fifth tergite indicate sensory pits); 11, second to sixth sternites; 12, spermathecae and apical part of spermathecal duct; 13, basal parts of spermathecal ducts. Scales indicate 0.5 mm in Figs. 10–11, and 0.1 mm in Figs. 12–13.

0.92: 1.0: 1.1–1.3 in male (0.92: 1.0: 1.3 in holotype), 0.75–0.85: 1.0: 0.55–0.64 in female.

Material examined. Holotype (♂), labelled "THAILAND, Doi Saket, 300 m, C. Chieng Mai, 15. IX. 1975" and "Collector, R. Kano". Paratypes: Thailand-1 ♂, Fang, 13. VI. 1965, Y. MIYATAKE; 1 ♂ 1 ♀, same as above, but 14. VI. 1965; 1 ♂, Chieng Dao, 15. VI. 1965, Y. MIYATAKE; 1 ♂ 2 ♀, Chieng Mai, 16. VI. 1965, Y. MIYATAKE. The holotype is deposited in the National Science Museum (Natural History), Tokyo. The paratypes are deposited in the Entomological Laboratory, College of Agriculture, University of Osaka Prefecture, Sakai.

Distribution. Thailand.

Remarks. This species, *R. curvinervis* n. sp., *R. dasyixys* n. sp., and *R. fulvidorsalis* n. sp. share the following unique characters, which are probably apomorphic with respect to the genus: Outer surstylus without group of minute teeth on inner side; inner surstylus without membranous cleft. *Rivellia kaochangensis* n. sp. may possess these characters, although its male is unknown, because *R. kaochangensis* n. sp. is considered as a close relative of *R. curvinervis* n. sp.

This species is very similar to *R. dasyixys* n. sp. and *R. fulvidorsalis* n. sp. These three species are characterized by the following feature: Marking on wing apex strongly projecting basally on vein R_{4+5} and vein M_1 respectively, or on either vein R_{4+5} or vein M_1 . But it differs from *R. dasyixys* n. sp. in having the thick first flagellomere which is twice as long as thick and fine and sparse hairs on anterolateral parts of the first+second abdominal syntergite in male, and from *R. fulvidorsalis* n. sp. in having the wider wing (compare Fig. 3 with Fig. 21) and, in male, the ab-

sence of a membranous apical projection on the glans. For further comparisons, see under those species.

Rivellia dasyixys n. sp.

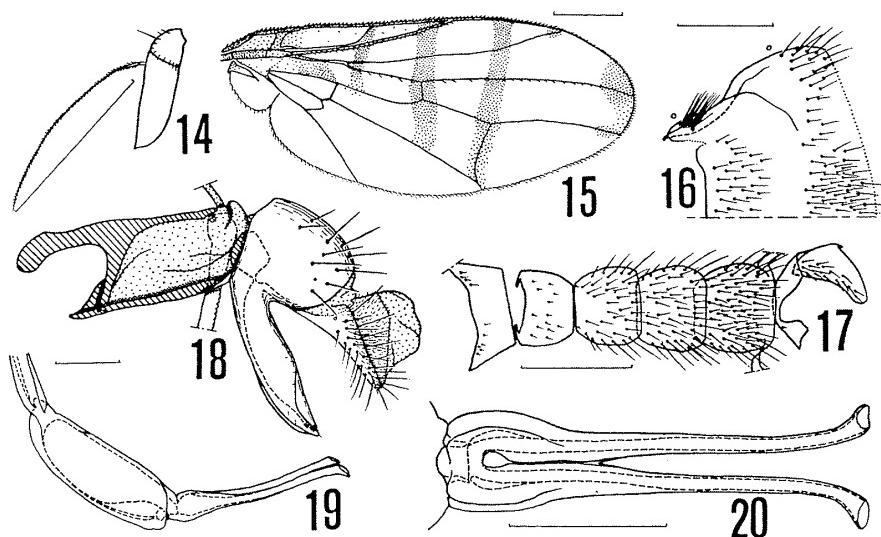
(Figs. 14–20)

Male (holotype). Very similar to *R. varia* n. sp., but differing from it as follows:

Head and thorax yellowish orange; abdomen dark brown, widely yellow anterolaterally. Legs mostly yellow, darkened only on apices of tarsi. Wing marking (Fig. 15) mostly dark brown, but longitudinal stripe over h yellow, paler than other markings; small spot on apex of cell r_1 extending beyond vein R_{2+3} posteriorly. First flagellomere about 2.5 times as long as thick (Fig. 14). Distance between apical scutellar bristles about 1.2 times as long as that between basal and apical scutellar bristles. First+second syntergite of abdomen with long and dense hairs anterolaterally (Fig. 16). Hairs on fifth abdominal sternite not dense posterolaterally (Fig. 17). Apical projection of outer surstyli short (Fig. 18). Acrophallus as in Figs. 19–20, about two-thirds as long as basal sclerotized capsule of glans.

Measurements. Body length, 3.4 mm. Wing length, 3.1 mm. Gena/head capsule in height, 0.13. Distance between junctions of M with dm-cu and r-m/that between junctions of M with r-m and bm-cu, 0.85. Distance between apex of M_1 and junction of M with dm-cu/that between junctions of dm-cu with M and CuA₁, 2.1. Ratio of lengths of third to fifth abdominal tergites, 0.88: 1.0: 1.1.

Female. Unknown.



Figs. 14–20. *Rivellia dasyixys* n. sp., male (holotype). — 14, Right antenna in inner view; 15, right wing; 16, right half of first+second abdominal syntergite; 17, first to eighth abdominal sternites; 18, terminalia in lateral view; 19, glans in lateral view; 20, apical part of glans in anterior view. Scales indicate 0.5 mm in Figs. 14–17, and 0.1 mm in Figs. 18–20.

Material examined. Holotype (δ), labelled "THAILAND: nr. Sai Yok, 500 m, Kanchana Buri, 11. IX. 1975" and "Collector, H. Kurahashi". The holotype is deposited in the National Science Museum (Natural History), Tokyo.

Distribution. Thailand.

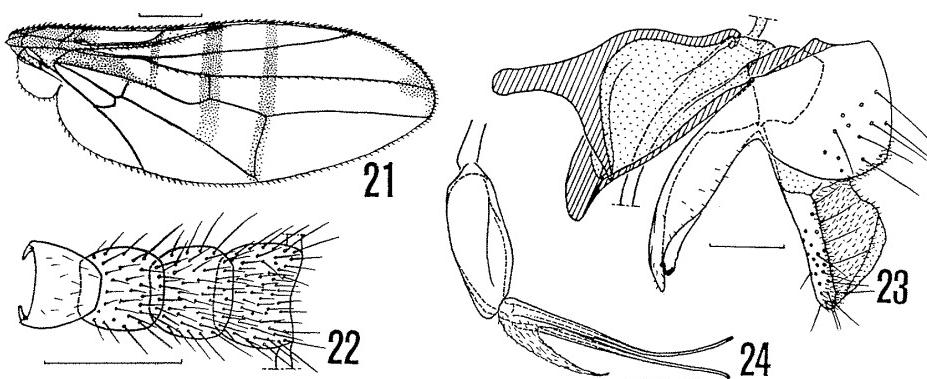
Remarks. This species is very similar to *R. varia* n. sp. and *R. fulvidorsalis* n. sp. as stated under the remarks of *R. varia* n. sp. But it differs from *R. varia* n. sp. as stated above and from *R. fulvidorsalis* n. sp. as follows: Wing wider (compare Fig. 15 with Fig. 21); longitudinal stripe over crossvein h distinctly paler than other wing markings; in male abdomen, first+second syntergite with long and dense hairs anterolaterally, and glans without membranous apical projection.

Rivellia fulvidorsalis n. sp.

(Figs. 21–24)

Male (holotype). Very similar to *R. varia* n. sp., but differing from it as follows: Body and legs dark brown, orange on scutum and scutellum, yellow on basal halves of tarsi. Wing marking (Fig. 21): Transverse bands over r-m and dm-cu almost parallel. First flagellomere about 2.3 times as long as thick. Distance between apical scutellar bristles about 1.3 times as long as that between basal and apical scutellar bristles. Wing relatively narrow (Fig. 21); distance between apices of vein R_1 and R_{2+3} distinctly longer than that between apices of R_{2+3} and R_{4+5} ; distance between apex of M_1 and junction of dm-cu with M 2.7 times as long as that between junctions of dm-cu with M and CuA₁ (Fig. 21). Hairs on fifth abdominal sternite not dense posterolaterally (Fig. 22). Apical projection of outer surstyli relatively short (Fig. 23). Glans apically with long membranous projection, with acrophallus about as long as basal sclerotized capsule of glans (Fig. 24).

Measurements and additional notes. Body length, 3.4 mm. Wing length, 3.2 mm. Gena/head capsule in height, 0.15. Distance between junctions of M with



Figs. 21–24. *Rivellia fulvidorsalis* n. sp., male (holotype). — 21, Right wing; 22, second to fifth abdominal sternites; 23, terminalia in lateral view; 24, glans in lateral view. Scales indicate 0.5 mm in Figs. 21–22, and 0.1 mm in Figs. 23–24.

dm-cu and r-m that between junctions of M with r-m and bm-cu, 0.72. Ratio of lengths of third to fifth abdominal tergites, 0.87: 1.0: 1.2.

Outstanding bristles are not recognized on the postgena of the holotype, and are probably missing.

Female. Unknown.

Material examined. Holotype (δ), labelled "N. THAILAND, CHIENG MAI: Doi Suthep 1000 m, (nr. Temple), 19. VI. 1965, Yorio Miyatake". The holotype is deposited in the Entomological Laboratory, College of Agriculture, University of Osaka Prefecture, Sakai.

Distribution. Thailand.

Remarks. This species is very similar to *R. varia* n. sp. and *R. dasyixys* n. sp. as stated under the remarks of *R. varia* n. sp., but differs from them as follows: Wing narrower (compare Fig. 21 with Figs. 3 and 15); transverse bands over crossveins r-m and dm-cu almost parallel; in male terminalia, glans with long membranous apical projection.

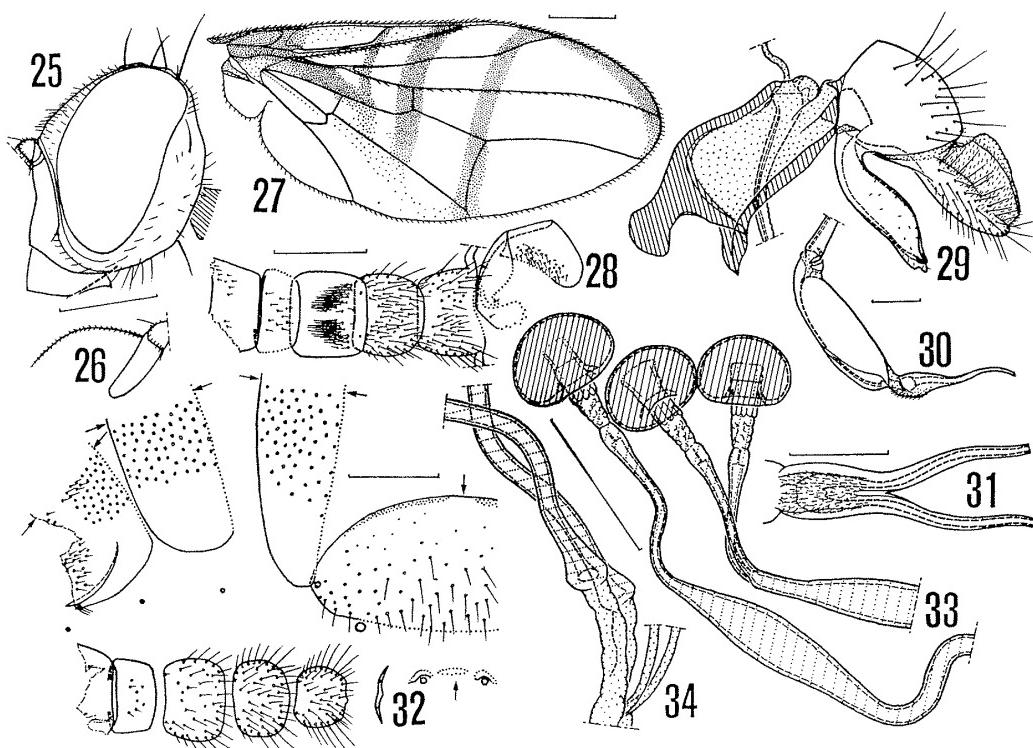
Rivellia curvinervis n. sp.

(Figs. 25–34)

Male and female. Similar to *R. varia* n. sp., but differing from it as follows:

Head and thorax brownish orange; abdomen dark brown; thorax slightly darkened ventrally or not (darkened in holotype). Wing marking (Fig. 27): Transverse band from apex of vein Sc fused with longitudinal stripe on basal part of cell br along M; marking on wing apex long and narrow, extending from anterior end of transverse band over dm-cu to apex of M_1 along C, with inner margin not convex throughout.

Upper part of occiput and face slightly concave in profile (Fig. 25). First flagellomere about 2.5 times as long as thick, with apex rounded in lateral view (Fig. 26). Medial height of clypeus about 2/5 as long as that of face. Wing: Distance between apices of R_1 and R_{2+3} shorter than that between apices of R_{2+3} and R_{4+5} (Fig. 27); distance between junctions of M with dm-cu and r-m 1.1–1.2 times as long as that between junctions of M with r-m and bm-cu (1.1 in holotype); R_{2+3} strongly sinuous. Male abdomen (Figs. 28–31): Ratio of lengths of third to fifth tergites, 1.0: 1.0: 1.4; second sternite shortened; third sternite with pair of groups of dense hairs; hairs on fifth sternite not dense posterolaterally; outer surstyli with small apical projection, with anterior margin emarginate near apex in lateral view; hypandrial ring curved down anteriorly in lateral view from left; acrophallus sinuous in lateral view. Female abdomen (Figs. 32–34): Posterolateral part of first + second syntergite and lateral parts of third and fourth tergites without hairs; ratio of lengths of third to fifth tergites, 1.1–1.2: 1.0: 1.6–1.7 (1.1: 1.0: 1.6 in holotype); third spiracle widely separated from its segmental tergite; spermatheca hemispherical; apical section of spermathecal duct relatively long; spermathecal ducts membranous basally.



Figs. 25–34. *Rivellia curvinervis* n. sp. (holotype: Figs. 25–27, 32–34). — 25, Head in lateral view; 26, right antenna in inner view; 27, right wing; 28, first to eighth abdominal sternites in male; 29, male terminalia in lateral view; 30, glans in lateral view; 31, apical part of glans in anterior view; 32, first to sixth abdominal segments in female (arrows indicate the dorsal median line; dots on the fifth tergite indicate sensory pits); 33, spermathecae and apical parts of spermathecal ducts; 34, basal parts of spermathecal ducts. Scales indicate 0.5 mm in Figs. 25–28 and 32, and 0.1 mm in Figs. 29–31 and 33–34.

Measurements. Body length, 3.6–3.8 mm (3.8 mm in holotype). Wing length, 3.3–3.5 mm (3.5 mm in holotype). Gena/head capsule in height, 0.11–0.12 (0.11 in holotype).

Material examined. Holotype (♀), labelled "Isl. Biliran, Philippines, Baker". Paratypes: 1 ♂, labelled as holotype; 1 ♀, labelled "LAGUNA, P.I., 25. I. 55, F. E. Baisas"; 1 ♀, labelled "LEYTE P.I., 5 km E. Ormoc, 3–11. Oct. 1965, D. Davis 200 m". These types are deposited in the United States National Museum of Natural History, Washington, D.C.

Distribution. Philippines.

Remarks. This species is very similar to *R. kaochangensis* n. sp. These two species are characterized by the following feature: Distance between apices of vein R_1 and vein R_{2+3} shorter than that between apices of vein R_{2+3} and vein R_{4+5} . But it is distinguished from the latter in having the strongly sinuous vein R_{2+3} , and, in female, the absence of hairs on the posterolateral part of first+second syntergite

and lateral parts of third and fourth tergites of abdomen. For a further comparison, see under the latter species.

Rivellia kaochangensis n. sp.

(Figs. 35-38)

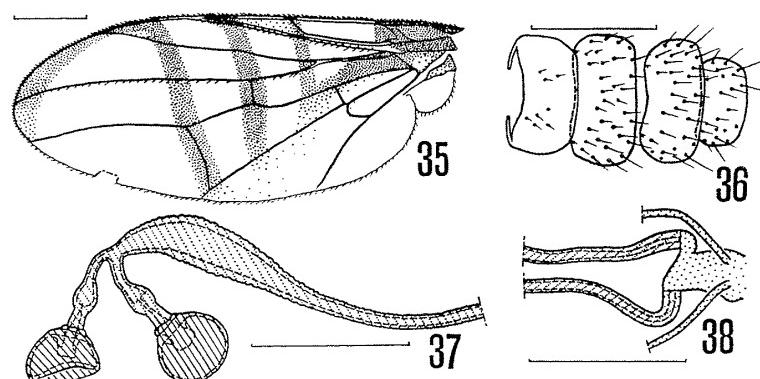
Female (holotype). Very similar to *R. curvinervis* n. sp., but differing from it as follows:

In wing, hyaline part between transverse bands over apex of vein Sc and r-m not much narrower than hyaline part between transverse bands over r-m and dm-cu (Fig. 35). Head as in Fig. 1, in profile more deeply concave on face and dorsal part of occiput respectively. Medial height of clypeus about half as high as that of face. In wing, distance between apices of R_1 and R_{2+3} slightly shorter than that between apices of R_{2+3} and R_{4+5} ; R_{2+3} slightly sinuous; distance between junctions of M with dm-cu and r-m 0.86 as long as that between junctions of M with r-m and bm-cu. Abdomen: Tergites mostly covered with hairs as in Fig. 10; ratio of lengths of third to fifth tergites, 0.89: 1.0: 0.86; third to fifth sternites distinctly wider than long respectively; third spiracle located near its segmental tergite as in Fig. 10; spermatheca spherical (Fig. 37); apical section of spermathecal duct short; spermathecal duct not membranous basally (Fig. 38).

Measurements and additional notes. Body length, 3.5 mm. Wing length, 3.3 mm. Gena/head capsule in height, 0.12.

The front-orbital bristles and antennae of the holotype are missing, and their conditions are unknown.

Material examined. Holotype (♀), labelled "S. THAILAND, Kao Chang, 26. VI. 1965, Yorio Miyatake". The holotype is deposited in the Entomological Laboratory, College of Agriculture, University of Osaka Prefecture, Sakai.



Figs. 35-38. *Rivellia kaochangensis* n. sp., female (holotype). — 35, Left wing; 36, second to fifth abdominal sternites; 37, spermathecae and apical part of spermathecal duct; 38, basal parts of spermathecal ducts. Scales indicate 0.5 mm in Figs. 35-36, and 0.1 mm in Figs. 37-38.

Distribution. Thailand.

Remarks. This species is very similar to *R. curvinervis* n. sp. as stated under the remarks of the latter, but is distinguished from it by the following feature: Vein R_{2+3} slightly sinuous; hyaline part between transverse bands over apex of vein Sc and crossvein r-m slightly narrower than hyaline part between transverse bands over crossveins r-m and dm-cu; in female, abdomen mostly covered with hairs.

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Reference

- HARA, H., 1993. *Rivellia basilaris* (WIEDEMANN) (Diptera, Platystomatidae) and its allied species in East Asia I. *Jpn. J. Ent.*, **61**: 819–831.

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